

# AGENDA - Advanced School on HPC Computing with GPU Accelerators

Monday, 20 November 2023 09:30 to Friday, 24 November 2023 17:30

ONLINE EDITION

TEACHERS: Luca Ferraro, Sergio Orlandini, Laura Bellentani, Nitin Shukla, Giorgio Amati, Matteo Turisini, Alessandro Masini, Michael Redenti

## Day 1

Morning: 9:30-12:30

- Introduction to modern HPC Accelerated Cluster Architectures
- GPU Architectures
- Leonardo Architecture

Afternoon: 14:30-17:30

- Intro to OpenX offloading (the OpenMP/OpenACC approach)
- Examples/Exercises

## Day 2

Morning: 9:30-12:30

- More on OpenX offloading

Afternoon: 14:30-17:30

- Profiling MPI/GPU Applications
- Examples/Exercises

## Day 3

Morning: 9:30-12:30

- Introduction to CUDA C/Fortran

Afternoon: 14:30-17:30

- CUDA execution model
- Examples/Exercises

## Day 4

Morning: 9:30-12:30

- CUDA Asynchronous operations, streams, multi-GPU
- Examples/Exercises

Afternoon: 14:30-17:30

- CUDA memory accesses, shared-memory, Matrix Product Enhanced / Matrix Transpose
- Examples/Exercises

## Day 5

Morning: 9:30-12:30

- GPU Computing with SYCL
- GPU Computing with KOKKOS
- Examples/Exercises

Afternoon: 14:30-17:30

- Accelerating python with GPU
- Final Remarks and Conclusions